POLI 395: Introduction to Statistics

Spring 2018 (Syllabus Version: 1/26/2018)

210 Herzstein Hall, T R 9:25a-10:40a

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COURSE OBJECTIVES AND LEARNING OUTCOMES

This course introduces students to basic ideas in scientific epistemology, social science research design, statistical analysis, and the application of all these ideas to substantive questions in political science.

Students will be able to:

1. understand basic approaches to the scientific study of the social world to substantive topics in political science;
2. execute and interpret statistical analysis of quantitative political data to answer about substantive questions in political science; and
3. recognize and understand threats to inference based on empirical data in political science, including the weaknesses of research designs and statistical analyses.

GRADING POLICIES AND ASSIGNMENT DETAILS

Grade Components:

- Homework: 30%
- Midterm Exam: 35%
- Final Exam: 35%

Grading Scale:

100%-97%: A+
96.9%-93%: A
92.9%-90%: A-
89.9%-87%: B+
86.9%-83%: B
82.9%-80%: B-
79.9%-77%: C+
76.9%-73%: C
72.9%-70%: C-
69.9%-67%: D+
66.9%-63%: D
62.9%-60%: D-
>59.5%: F

Exams: There will be wo exams in this class, a midterm and a final. All exams are cumulative, but will focus on material learned since the last exam. Exams will be take home, you will have 90 minutes in which to take the exam and you will be bound by

the honor code when taking the exam. No class materials, references, or other students may be consulted during an exam.

Homework: Homework problem sets will be distributed on Canvas. I encourage collaborative work on problem sets: the goal of a homework problem set is to help you learn the material and enable you to perform well on the (non-collaborative!) exams. With that said, simply copying another student's homework answers is not permitted and will be treated as academic dishonesty.

Attendance: Regular attendance is typically a prerequisite for success in the class, although no points are deducted on the basis of an absence alone. Anything taught in class is testable material, and not everything I teach in class will be in the course reading material.

COURSE POLICIES

T/A Office Hours: The teaching assistant for this class is Kristin Bryant, a PhD student in the political science department. Kristin will hold office hours for four hours per week, assisted by two undergraduate T/As. The time and place for these sessions will be announced on Canvas during the first two weeks of class.

Late Work: Assignments are due at the date and time I specify for the assignment. Late homeworks will be marked off at 5 percentage points for the first 24 hours late, and an additional 10 percentage points for every subsequent 24 hours late.

Important note: Students are responsible for submitting working, uncorrupted files for all assignments. If a file is corrupted and needs to be re-sent, and re-sending happens after the assignment deadline, a late penalty will be assessed.

Exams may not be taken late. Failing to take the exam at the scheduled time will result in no credit for the exam.

Penalties for late homeworks or missed exams may be waived under the following three circumstances:

(1) a death in the immediate family (parent, spouse, sibling, or child) within two weeks before the assignment due date;
(2) in the event of an unforeseeable medical emergency affecting you, your spouse, or your child; or
(3) participation in a Rice-sponsored academic or sporting event.

In the event of (1) or (3), you must give me **at least 24 hours advance notice and preferably more** (via e-mail or a phone call) that you will miss the exam/homework, or it may not be made up. I may require supporting documentation. All penalty waivers are at the discretion of the instructor. Under these circumstances, I will

extend your homework due date or schedule you a make-up exam time. **Important note: conflicts with a work schedule, non-academic trip, or vacation are not a valid reason to miss an exam or any other assignment** and cannot be the basis for a penalty waiver.

Honor Code/Academic Misconduct: All forms of academic misconduct will be handled according to the Rice University Honor Code. Details on the Honor Code are available at http://honor.rice.edu/honor-system-handbook/.

If you ever have any questions about what you should do to stay within the honor code on a particular assignment, **contact me with your question and I can assist you**. I cannot guarantee a timely response unless you contact me at least 24 hours in advance of the time the assignment is due.

Students with Disabilities: If you have a disability and require accommodation in this class, please contact me as soon as possible (within the first two weeks of class) to discuss these accommodations. You will also need to contact the Disability Support Services Office (telephone extension: 5841) in the Allen Center.

Syllabus Change Policy: All policies of this syllabus may be changed by Prof. Wilson with advance notice.

COURSE MATERIALS

Required Texts:

- Kellstedt and Whitten. 2013. *The Fundamentals of Political Science Research, Second Edition.* Cambridge University Press.
- James E. Monogan III. 2015. *Political Analysis Using R.* Springer.

Optional Texts:

- Maindonald and Braun. 2013. *Data Analysis and Graphics using R: An Example Based Approach, Third Edition.* Cambridge University Press. (Expensive, but comprehensive. Buy it if you think you'll be pursuing statistics in the future.)
- Venables, Smith and the R Core Team. 2017. An Introduction to R. Version 3.2.3. https://cran.r-project.org/doc/manuals/R-intro.pdf (This is free and is a nice overview of R.)

Other readings are available on the Canvas website.

Software: This course will teach material primarily through R. We will be using a server that is specially configured for R. You will need your computer (or a tablet) and a browser.

In order to use R you will go to: https://rstudio.justinesarey.com/ In order to use this protected server you will need a user name and password (which will be supplied).

In addition R is free and available for Windows and Macintosh from http://cran.r-project.org/. RStudio is also free and available for Windows and Macintosh at http://www.rstudio.com.

All students must have a valid Rice e-mail address and login (and access to the Canvas website) to participate in this course.

COURSE OUTLINE AND ASSIGNED READINGS

Date	Topic	Readings
Jan 11	**Introduction** **A bit of R**	• Monogan, Ch. 1
Jan 16	**Descriptive Statistics and Graphs with R/RStudio**	• Monogan, Ch. 2.1-2.6, Ch. 3.1-3.2
Jan 16	Assignment 1 On Canvas	
Jan 18	**Is political science really science?**	• Kellstedt and Whitten, Ch. 1 up to and including Section 1.2. • Karl Popper, "Science as Falsification." URL: https://goo.gl/aCVTI9 • Cowl, Clayton et al. 1998. "Factors Associated with Fatalities and Injuries from Hot-Air Balloon Crashes," Journal of the American Medical Association, 279 (13): 1011- 1014.
Jan 23	Assignment 1 Due	
Jan 23	Assignment 2 On Canvas	
Jan 23	**Research questions, theories, concepts, and hypotheses**	• Kelllstedt and Whitten, Ch. 1 and 2.
Jan 25	**Research design I: the logic of experimentation and causal inference**	• Kellstedt and Whitten, Ch. 3 and Ch. 4 up to and including Section 4.2.

Jan 30	**Research design I: the logic of experimentation and causal inference**	• Joel Turner, "The Messenger Overwhelming the Message: Ideological Cues and Perceptions of Bias in Television News." *Political Behavior* 29 (December 2007): 441-464. URL: http://goo.gl/ENqx9w
Feb 1	**Research Design II: non-experimental, large sample designs**	• Kellstedt and Whitten, Ch. 4, Section 4.3-end. • Alan S. Gerber and Donald P. Green, "Do Phone Calls Increase Voter Turnout? A Field Experiment." *Public Opinion Quarterly* 65 (Spring 2001). URL: http://goo.gl/KAdNMW. • Monogan Ch. 3.3-3.4
Feb 6	**Research Design II: non-experimental, large sample designs**	• Jeffrey S. DeSimone, "Fraternity Membership and Binge Drinking." *Journal of Health Economics* 26 (September 2007), 950-967. URL: http://goo.gl/nBK9ON. • David Broockman and Donald P. Green, "Do Online Advertisements Increase Political Candidates' Name Recognition or Favorability? Evidence from Randomized Field Experiments." *Political Behavior* 36 (2014), 263-289.
Feb 8	Assignment 2 Due	
Feb 8	Assignment 3 on Canvas	
Feb 13	**Research Design III: non-experimental, case study designs**	• James Mahoney. "Strategies of Causal Inference in Small-N Analysis." *Sociological Methods and Research* 28 (2000): 387-424. URL: http://goo.gl/HCjR6O. • Ashutosh Varshney, "Ethnic Conflict and Civil Society: India and Beyond." *World Politics* 53 (April 2001), 362-398, especially 370-374. URL: http://goo.gl/eZnmCV.

Feb 15	**Measurement: levels of measurement, reliability, and validity**	• Kellstedt and Whitten, Ch. 5 up to and including Section 5.8.
Feb 20	**Measurement: levels of measurement, reliability, and validity**	• Jeffrey A. Segal and Albert D. Cover, "Ideological Values and the Votes of US Supreme Court Justices." *American Political Science Review* 83 (June 1989), 557-564. URL: http://goo.gl/Wxpc7N.
Feb 22	Assignment 3 Due	
Feb 22	**Techniques for and problems with social scientific data collection**	• Shahryar Minhas, Jay Ulfelder and Michael D. Ward, "Mining texts to efficiently generate global data on political regime types." *Research and Politics* (2015) **DOI:** 10.1177/2053168015589217
Feb 27	**Techniques for and problems with social scientific data collection**	• Steven Levitt and Sudhir Venkatesh, "An Economic Analysis of a Drug-Selling Gang's Finances." *Quarterly Journal of Economics* 115 (2000): 755-789. URL: http://goo.gl/lZrv9F. • Yale IRB Training, "Introduction/Ethical Overiew." URL: http://goo.gl/HKzTf8. Special note: make sure to read the following links the module: "Introduction" (http://goo.gl/HKzTf8), "Respect for Persons" (http://goo.gl/FeP3Ov), "Beneficence" (http://goo.gl/17F6fh), "Justice" (http://goo.gl/KGNtYc), and "The importance of conducting research ethically" (http://goo.gl/7BXOZX).
Mar 1	**Descriptive Statistics**	• Kellstedt and Whitten, Ch. 5. from Section 5.9 to the end • Monogan, Ch. 4.1
Mar 1	Midterm Exam Distributed	

Mar 6	**Descriptive Statistics**	• Kellstedt and Whitten, Ch. 5. from Section 5.9 to the end • Monogan, Ch. 4.2 • Adam Hughes, "Visualizing inequality: How graphical emphasis shapes public opinion." *Research and Politics* (2015), **DOI:** 10.1177/2053168015622073.
Mar 6	Midterm Exam Due	
Mar 6	Assignment 4 on Canvas	
Mar 8	**Probability distributions and sampling**	• Kellstedt and Whitten, Chapter 6. • Monogan, Review Ch. 3.
Mar 20	**Probability distributions and sampling**	• Kellstedt and Whitten, Chapter 6.
Mar 22	Assignment 4 Due	
Mar 22	Assignment 5 on Canvas	
Mar 22	**Basic hypothesis testing**	• Kellstedt and Whitten, Ch. 7, Sections 7.1-7.3 and 7.4.2.
Mar 27	**Basic hypothesis testing**	• Jeffrey J. Mondak, "Newspapers and Political Awareness." *American Journal of Political Science* 39 (May 1995); see especially pp. 523-525, for a two-sample t-test. URL: http://goo.gl/oydzPW. • Monogan, Ch. 5.1
Mar 29	**Crosstabs and the χ^2 test**	• Kellstedt and Whitten, Ch. 7, Section 7.4.1 • Monogan, Ch. 5.2. • Second look: Alan S. Gerber and Donald P. Green, "Do Phone Calls Increase Voter Turnout? A Field Experiment." *Public Opinion Quarterly* 65 (Spring 2001), 75-85; see especially p. 79 for data for a chi-squared test. URL: http://goo.gl/KAdNMW.
Apr 3	Assignment 5 Due	

Apr 3	Assignment 6 on Canvas	
Apr 3	**Correlation**	• Kellstedt and Whitten, Ch. 7, Section 7.4.3 • Amy Caiazza, "Does Women's Representation in Elected Office Lead to Women-Friendly Policy?" *Women and Politics* 26 (2004), 35-70. URL: http://goo.gl/C417VH. • Monogan, Ch. 5.3
Apr 5	**Regression I: theory and basics**	• Kellstedt and Whitten, Ch. 8., Sections 8.1-8.4.
Apr 10	**Regression I: theory and basics**	• Monogan, Ch. 6.1
Apr 12	**Regression II: inference, multiple regression, and interpretation**	• Kellstedt and Whitten, Ch. 9 • Alan Abramowitz, "Will Time for Change Mean Time for Trump?" *PS: Political Science and Politics* 49 (2016): https://doi.org/10.1017/S1049096516001268
Apr 17	Assignment 6 Due	
Apr 17	**Regression II: inference, multiple regression, and interpretation**	• Monogan, Ch. 6, Sections 6.2.1-6.2.3 • Donohue III, John J., and Steven D. Levitt. "The impact of legalized abortion on crime." *The Quarterly Journal of Economics* 116, no. 2 (2001): 379-420: https://goo.gl/ZnurCX